Attached hereto is a marked-up version of the changes made to the specification and claims by the current amendment. The attached page is captioned **"Version with markings to show changes made."**

If a telephone interview would be of assistance in advancing prosecution of the subject application, the Examiner is requested to telephone Applicants' undersigned attorney at the number provided below.

Respectfully submitted,

Date: February 13, 2002

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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the specification:

Paragraph beginning at line 23 of page 1 has been amended as follows:

However, when a pipette tip is mounted to the nozzle, it is important that the tip be mounted with sufficient force to seal the nozzle so that fluid being aspirated and dispensed does not leak around the tip-nozzle junction, thereby preventing accurate quantities of fluid from being aspirated and dispensed, and the tip must be mounted with sufficient force to prevent the tip from falling off. However, if the tip is mounted with too much force, it can become difficult to remove the tip from the nozzle after use, resulting in significant strain on the operator's hand. For this and other reasons, an operator working in a laboratory or other facility where large numbers of tips are replaced each day may experience repetitive stress injuries with current pipette designs as a result of repeated tip removals.

Paragraph beginning at line 29 of page 6 has been amended as follows:

A latch mechanism 30 is provided which includes a button 32 mounted in outer sleeve 16A of the housing. Button 32 is biased toward the latched position shown in Fig. 1B by compression spring 34 mounted inside collar 36 extending from housing sleeve 16A, spring 34 extending between an outside wall of housing sleeve 16A and an inside wall of button 32. Button 32 has an enlarged, generally circular, inner end 38 and a narrower shaft portion 40 connecting the large end 38 to the remainder of the button 32. Sleeve 18 has a keyhole slot formed on the side thereof adjacent button 32, the slot having an enlarged forward portion 42 which is slightly larger than enlarged tip 38 of button 32, and a narrower rear portion 44 (Fig. 1B) which is slightly larger than shaft portion 40 of the latch button 32, but significantly smaller than enlarged portion 38.

Paragraph beginning at line 7 of page 7 has been amended as follows:

In operation, the nozzle assembly 14 is initially in the released position shown in Fig. 1A. When the operator places a tip 10 over the end of nozzle 12 and starts to push

down to mount the tip 10 on the nozzle 12, the first thing that happens is that the bottom of tip 10 engages the distal or outer end 48 of ejector sleeve 18, pushing sleeve 18 into housing 16 between housing sleeve 16A and 16B against the bias force of spring 24. As force continues to be exerted on tip 10 to mount it to nozzle 12, the tip 10 eventually makes contact with the nozzle 12 and becomes mounted thereto. Once the force exerted through tip 10 on nozzle 12 exceeds the bias force of spring 20, nozzle 12 moves rearward in housing 16 against the bias of spring 20, preventing excessive force from being applied to mount tip 10 to nozzle 12. The force with which the tip is mounted to the nozzle 12 is thus carefully controlled so as to be enough to seal the nozzle/tip joint and to keep the tip 10 in place, while still leaving the tip 10 easily removable. As tip 10 continues to be pushed against nozzle 12, sleeve 18 is ultimately moved against the bias of spring 24 to a position where the enlarged portion 42 of the slot in sleeve 18 is adjacent large portion 38 of button 32. When this happens, button 32 is moved outward under the bias force of spring 34 to move enlarged portion 38 into opening 42 in ejector sleeve 18, thereby latching nozzle assembly 14 in the latched position shown in Fig 1B. The click from latch 30 engaging provides an audible feedback to the operator, and the movement of button 32 also provides a tactile and visual feedback to the operator, that the tip 10 is fully mounted so that the operator may terminate the mounting operation. If the user continued to exert force after latching occurs, sleeve 48 ultimately bottoms against housing 16, thus limiting travel of tip 10 and limiting the mounting force on the tip 10 to that exerted by compressed spring 20. When the operator releases tip 10, nozzle 12 is moved by its bias spring 20 to the position shown in Fig. 1B, this being the final position of the nozzle assembly 14 with the tip 10 mounted and the assembly in its latched position.

Paragraph beginning at line 15 of page 8 has been amended as follows:

Figs. 2A - 2D show an alternative embodiment of the invention which has an alternative latch mechanism 30' and also has an overforce feature not present in the embodiment of Figs. 1A-1B. In particular, sleeve 18', rather than having a keyhole slot formed in its side, has a flange 60 with a shoulder 62 and an angled outer wall 64 formed at the bottom or inner end thereof. Latch 30' includes a slotted plate 66 which is biased to

the latched position shown in Fig. 2B by tension spring 67 extending between posts fixed to housing portion 16C and to plate 66. Plate 66 also has an extended groove 84~~68~~ formed on the inner side thereof, which groove 84 may for example extend for approximately 90° and which has an upper shoulder 70. Plate 66 slides on a housing member 16C and is guided by four pins 72 extending from housing member 16C, which pins fit in mating slots 74 in plate 66 (see Fig. 2D). Plate 66 has an insert 76 with an angled inner wall 78. Plate 66 also has an opening 80 in its top through which sleeve 18' and nozzle 12 extend.

Paragraph beginning at line 28 of page 8 has been amended as follows:

In operation, latch assembly 30' is initially in the released position shown in Fig. 2A. As for the embodiment of Figs. 1A-1B, when tip 10 is mounted over nozzle 12, it initially makes contact with shoulder 48 of sleeve 18' moving the sleeve into the nozzle assembly 14' against the force of spring 24.

Paragraph beginning at line 1 of page 9 has been amended as follows:

This procedure continues until tip 10 has been mounted to nozzle 12 with sufficient force, at which time nozzle 12 also starts to move backwards against the force of spring 20. It is noted that for this embodiment of the invention, spring 20 engages a shoulder 22' on the nozzle 12 rather than a ring 22. Thus, as for the previous embodiment, the force with which tip 10 is mounted to nozzle 12 is controlled. When ejector sleeve 18' has been retracted to a position where shoulder 62 of flange 60 is adjacent shoulder 70 of slot 68, plate 66 may move under the force of the bias applied thereto by spring 67 to move shoulder 70 over shoulder 62, thereby engaging latch 30' to hold ejector sleeve 18' in the retracted position. As for the prior embodiment, this results in audio, tactile and visual feedback to the operator that the tip 10 is fully mounted and that the mounting operation may be terminated. Once the operator removes insertion pressure from the tip 10, spring 20 returns the nozzle 12 to the latched position shown in Fig. 2B.

Paragraph beginning at line 13 of page 9 has been amended as follows:

When latch 30' is to be released, the operator presses on surface 82 of plate 66, moving the plate to its released position against the bias force applied thereto by spring 67. This moves shoulder~~urface~~ 70 of slot 68~~0~~ away from flange 60~~2~~, permitting ejector sleeve 18' to be moved to its released position by spring 24. As for the prior embodiment, with spring 24 having a significantly greater force than spring 20, this results in shoulder 48 of the ejector sleeve 18' striking tip 10 with sufficient force to eject the tip 10 from nozzle 12.

Paragraph beginning at line 19 of page 9 has been amended as follows:

However, in the event the tip 10 becomes stuck as shown in Fig. 2C, pressure may continue to be exerted on surface 82 to force angled or wedge surface 78 of insert 76 against angled surface 64 of flange 60. This applies a wedge overdrive force through sleeve 18' to tip 10 which supplements the force provided by spring 24 so as to facilitate the removal of a stuck tip 10, thereby permitting sleeve 18' to return to its fully released position.

Paragraph beginning at line 25 of page 9 has been amended as follows:

Figs. 3A-3D illustrate still another embodiment of the invention, which embodiment is utilized in conjunction with a pipette of the type described in application serial number 09/873,522 of the applicant entitled HAND HELD PIPETTE which is being filed concurrently herewith. As can be seen from these figures, the pipette of this embodiment is substantially the same as the pipettes of the prior embodiments except for the latching mechanism 30". For this embodiment of the invention, ejector sleeve 18' terminates in an angled flange 60 (Fig. 3B) having a shoulder 62 as for the embodiment of Fig. 2A-2D. As shown in Fig. 3B, shoulder 62 engages an internal end of a housing component 16A" when the mechanism is in its released position to define the end position of the ejector sleeve 18'. When in a latched position, as seen in Fig. 3D, shoulder 62 engages shoulders 90 of flanges 92 at the end of fingers 94. When button

32" is depressed, fingers 94 are moved down to move flange 92, and shoulder~~urface~~ 90 thereof, out of contact with shoulder~~urface~~ 62 of flange 60, permitting ejector sleeve 18' to return to the release position in a manner previously described to effect the ejection of tip 10. Fig. 3C illustrates nozzle 12 in the latched position. Except as indicated above, the embodiment of Figs. 3A-3D operates in substantially the same way as the embodiments previously described.

Paragraph beginning at line 21 of page 10 has been amended as follows:

Referring to Fig. 4, nozzle 12 is connected at a point remote from the tip 10, for example at the inner end of the nozzle 12, to a position detector 100, which is shown in the figure as a linear encoder 100. A sensor 102 is also provided to detect when sleeve 18 has moved by its full stroke. Where a latch 30 is provided, as for the previous embodiments, operation of the latch may be detected to indicate full stroke for the sleeve 18. In Fig. 4, sensor 102 includes a flag 104 mounted to move with sleeve 18 and a sensor 106, for example an optical sensor, which triggers when the flag 104 reaches the sensor 106. While not shown in Fig. 4 to simplify the figure, this embodiment would also include springs 20 and 24 and related components, and may include a latch 30 when also used as a detipper.

Paragraph beginning at line 30 of page 10 has been amended as follows:

In operation, each different tip type is designed to have slightly different base diameter, taper or other base dimension which does not affect its function, but which changes the point on the tip 10 at which nozzle 12 makes contact with the tip 10 relative to the tip end making contact with shoulder 48 of sleeve 18. This may also be achieve~~r~~d by providing an internal ring or shoulder 108 or some other feature on the inside of the tip base, the spacing of such shoulder from the base end of the tip or some other characteristic of the feature being controlled to indicate the tip type. Other detectable variations in the tip base are also possible to provide an indication of tip type.

Paragraph beginning at line 6 of page 11 has been amended as follows:

The variations in the tip base indicated above result in there being variations in the displacement of nozzle 12 for different tip types when sensor~~detector~~ 102 indicates that a full stroke has occurred for sleeve 18. Thus, the reading from encoder 100 when sensor 102 generates an output can serve as an indication of tip type, a processor controlling the pipetting operation correlating the encoder reading with the appropriate tip type. Where only two tip types are used, encoder 100 may be a simple switch which is closed for the displacement D for one tip type, but not the other.

In the claims:

Claims 1-3, 15-18 and 20-23 have been amended as follows. Claim 19 has been canceled without prejudice or disclaimer.

1. (Amended) In a pipette having a nozzle to which a tip may be removably mounted, a mechanism for facilitating the removal of ~~a~~the tip from the nozzle including:

a spring loaded ejector sleeve through which said nozzle passes, said sleeve terminating near an~~the~~ end of the nozzle to which a tip is mounted when the sleeve is in a normal position, the sleeve being moved away from said end of the nozzle against a~~said~~ spring load when the tip is mounted to said nozzle; and

said sleeve including a first latch portion which mates with a second latch portion of said pipette when said sleeve is in a retracted position to which said sleeve~~it~~ is moved when the~~a~~ tip is properly mounted to said nozzle to hold said sleeve in said retracted position against said spring load, and a third latch portion operable to unmate said first and second latch portions, freeing said sleeve to return in response to said spring load to the~~its~~ normal position, the sleeve engaging said tip before reaching said normal position to facilitate the removal of the tip.

2. (Amended) The~~A~~ mechanism as claimed in claim 1 including an overforce mechanism operable to supplement said spring load in moving said sleeve to said normal position against a stuck tip to further facilitate removal of said tip.

3. (Amended) The~~A~~ mechanism as claimed in claim 1 wherein said first latch portion is a keyhole slot formed in said sleeve, wherein said second latch portion is a detent having a large portion which fits in an enlarged portion of said slot when said sleeve is in the~~its~~ retracted position and a small portion sized to fit in a narrow portion of said slot, said narrow portion being adjacent said detent except when the sleeve is in the retracted position, and wherein said third latch portion is a button operable for moving said small portion of the detent into said narrow portion of said slot, whereby said sleeve becomes unlatched.

4. (Amended) The~~A~~ mechanism as claimed in claim 3 wherein said detent is spring biased to move the large portion of the detent into said enlarged portion of said slot.

5. (Amended) The~~A~~ mechanism as claimed in claim 1 wherein said first latch portion is a projection at a proximal end of said sleeve, said second latch portion is a mating lip on a latch plate biased to have the lip engage the projection when the sleeve is in its retracted position, and said third latch portion is a portion of said latch plate which is manually operable to move the plate against its bias to move said lip away from said projection, permitting said sleeve to return to its normal position.

6. (Amended) The~~A~~ mechanism as claimed in claim 5 including an angled surface on said plate positioned to engage an angled surface associated with said sleeve when said latch plate is moved beyond a~~the~~ point where said lip no longer engages said projection to supplement said spring load in moving said sleeve to the~~its~~ normal position against a stuck tip to further facilitate removal of said tip.

7. (Amended) The~~A~~ mechanism as claimed in claim 1 including a mechanism for controlling the force with which the~~a~~ tip is mounted to said nozzle.

8. (Amended) The~~A~~ mechanism as claimed in claim 7 wherein said mechanism for controlling includes mounting said nozzle to be movable away from a tip mounting force and against a bias spring.

9. (Amended) The~~A~~ mechanism as claimed in claim 8 wherein said bias spring has less load than the spring load applied to said ejector sleeve.

10. (Amended) The~~A~~ mechanism as claimed in claim 1 wherein said ejector sleeve is moved away from said end of the nozzle by said tip.

11. (Amended) The~~A~~ mechanism as claimed in claim 1 wherein said tip~~s~~ is~~are~~ mounted in a rack of a plurality of tips having a protrusion adjacent each tip, and wherein said ejector sleeve is moved away from said end of the nozzle by the protrusion adjacent the tip being mounted.

12. (Amended) The~~A~~ mechanism as claimed in claim 1 wherein the mating of said first and second latch portions results in an operator perceptible feedback output.

13. (Amended) The~~A~~ mechanism as claimed in claim 12 wherein said operator perceptable feedback output is at least one of an audible output and a tactile output.

15. (Amended) The~~A~~ mechanism as claimed in claim 14 including an overforce mechanism operable to supplement said bias in moving said ejector to said normal position against a stuck tip to further facilitate removal of said tip.

16. (Amended) The~~A~~ mechanism as claimed in claim 14 including a mechanism for controlling the force with which the~~a~~ tip is mounted to said nozzle.

17. (Amended) The~~A~~ mechanism as claimed in claim 14 wherein there are a plurality of different tip types, each of which contacts both the ejector and the nozzle as a respective tip~~it~~ is mounted to the nozzle and moves the respective tip~~each~~ against a bias force, each

tip type having a different base configuration which results in a difference in relative displacement of the nozzle to the ejector, and a mechanism for detecting such difference in the relative displacement to thus identify a tip type.

18. (Amended) A mechanism for facilitating the removal of a pipette tip from a pipette nozzle including a mechanism which stores mechanical energy when thea tip is mounted to said nozzle, and which releases the stored mechanical energy when the tip is to be removed to facilitate removal thereof, said mechanism for storing includes a latching mechanism operative when said mechanical energy is fully stored, an operator detectable output being generated when said latching mechanism operates.

20. (Amended) TheA mechanism as claimed in claim 18 including a mechanism which limits the force with which the tip is mounted to the nozzle.

21. (Amended) TheA mechanism as claimed in claim 18 including an overforce mechanism for further facilitating removal of a stuck tip.

22. (Amended) In a pipette, a mechanism for detecting athe type of pipette tip from a plurality of tip types being mounted to a pipette nozzle including:

a sleeve mechanism surrounding said nozzle, at least one of said sleeve mechanism and said nozzle being mounted to be selectively retracted when in contact with a tip as thea tip is pressed on said nozzle to be mounted thereto, each tip type having a different base configuration which results in a difference in the relative displacement of the nozzle to the sleeve mechanism, and a mechanism for detecting thesuch difference in the relative displacement to thus identify a tip type.

23. (Amended) TheA mechanism as claimed in claim 22 wherein said sleeve mechanism has a selected stroke, and wherein said mechanism for detecting includes a sensor generating an output when the sleeve mechanism is retracted for theits selected stroke and a detector for nozzle retraction, said detector output, when said sensor generates thean output, being indicative of tip type.

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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Applicants:	Richard A. Cronenberg and Dennis Mitchell
U.S. Serial No.:	09/873,842
Filing Date:	June 4, 2001
For:	**AUTOMATIC PIPETTE IDENTIFICATION AND DETIPPING**
Examiner:	Not Yet Assigned
Group Art Unit:	1744

I hereby certify that this paper is being deposited this date with the U.S. Postal Service in first class mail addressed to: Commissioner for Patents, Washington, D.C. 20231.

Eunhee Park (Reg. No. 42,976) — February 13, 2002 (Date)

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LETTER WITH PROPOSED DRAWING CHANGES

Box Non-Fee Amendment
Commissioner for Patents
Washington, D.C. 20231

Sir:

Applicants hereby propose to amend the drawings in the above-identified application as indicated in red on the copy submitted herewith.

More specifically, Applicants have amended: Fig. 2A to include numeral --84-- and to widen an end of tip 10 in order for tip 10 to fit on nozzle 12; and Fig. 2B to remove lines in the center of latch 30' and to widen an end of tip 10 in order for tip 10 to fit on nozzle 12. For the sake of clarity, Applicants have also redrawn Fig. 2C to add numeral --78-- and a line referenced by numeral 78, to add tension spring 67, to lengthen plate 66, to add numerals --64-- and --16C--, and to widen an end

of tip 10 in order for tip 10 to fit on nozzle 12. These and some additional minor changes were made to Fig. 2C to be consistent with Fig. 2B. Fig. 3B has been amended by changing numeral "18" to --18'--.

Upon approval of the herein-proposed drawing changes and the issuance of a Notice of Allowance, Applicants will promptly attend to correcting the formal drawings in accordance with present Office practices.

Dated: February 13, 2002

Respectfully submitted,
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Encl.

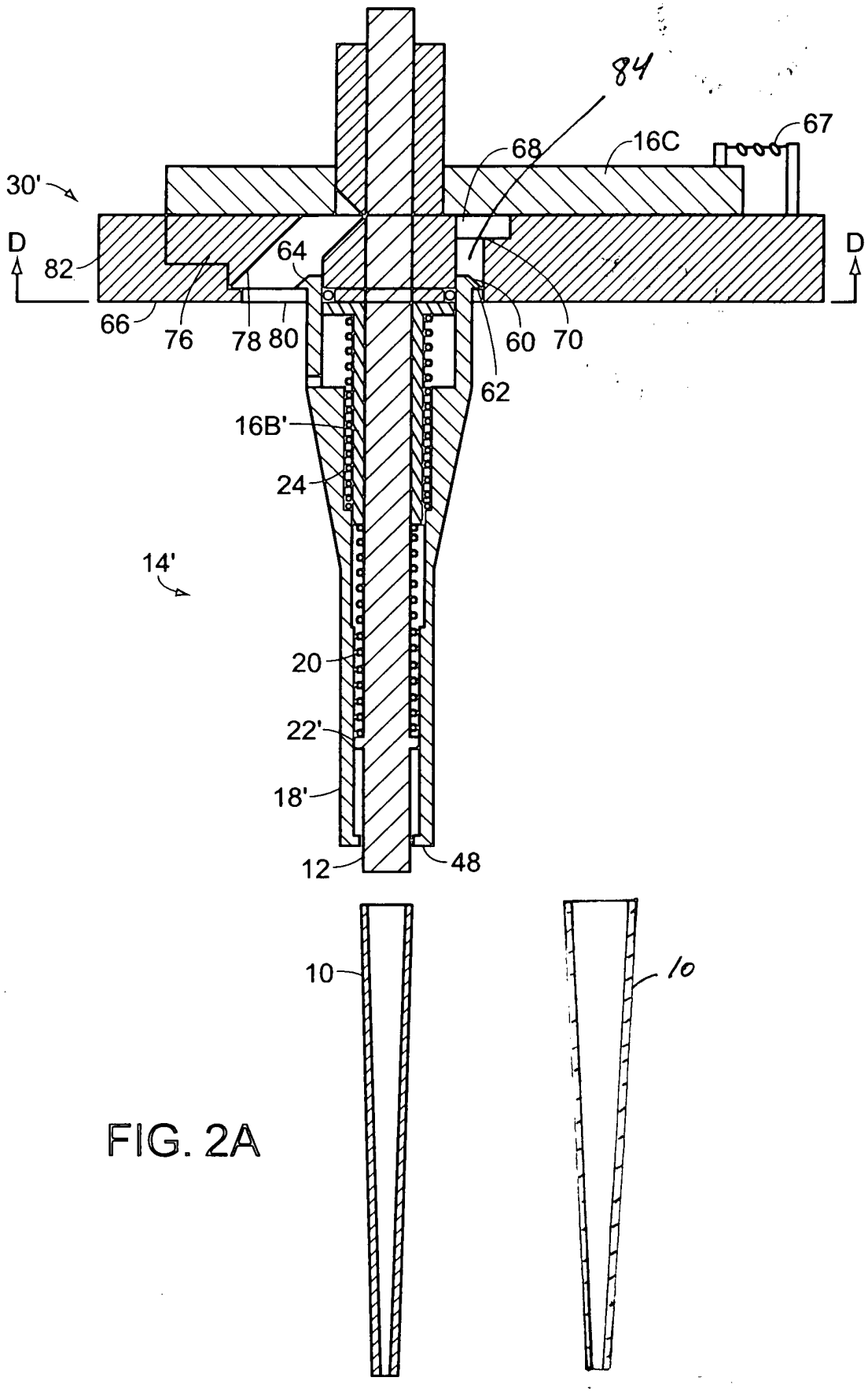

84
67
68
16C
30'
D
82
64
D
66
76
78
80
60
70
62
16B'
24
14'
20
22'
18'
12
48
10
10

FIG. 2A

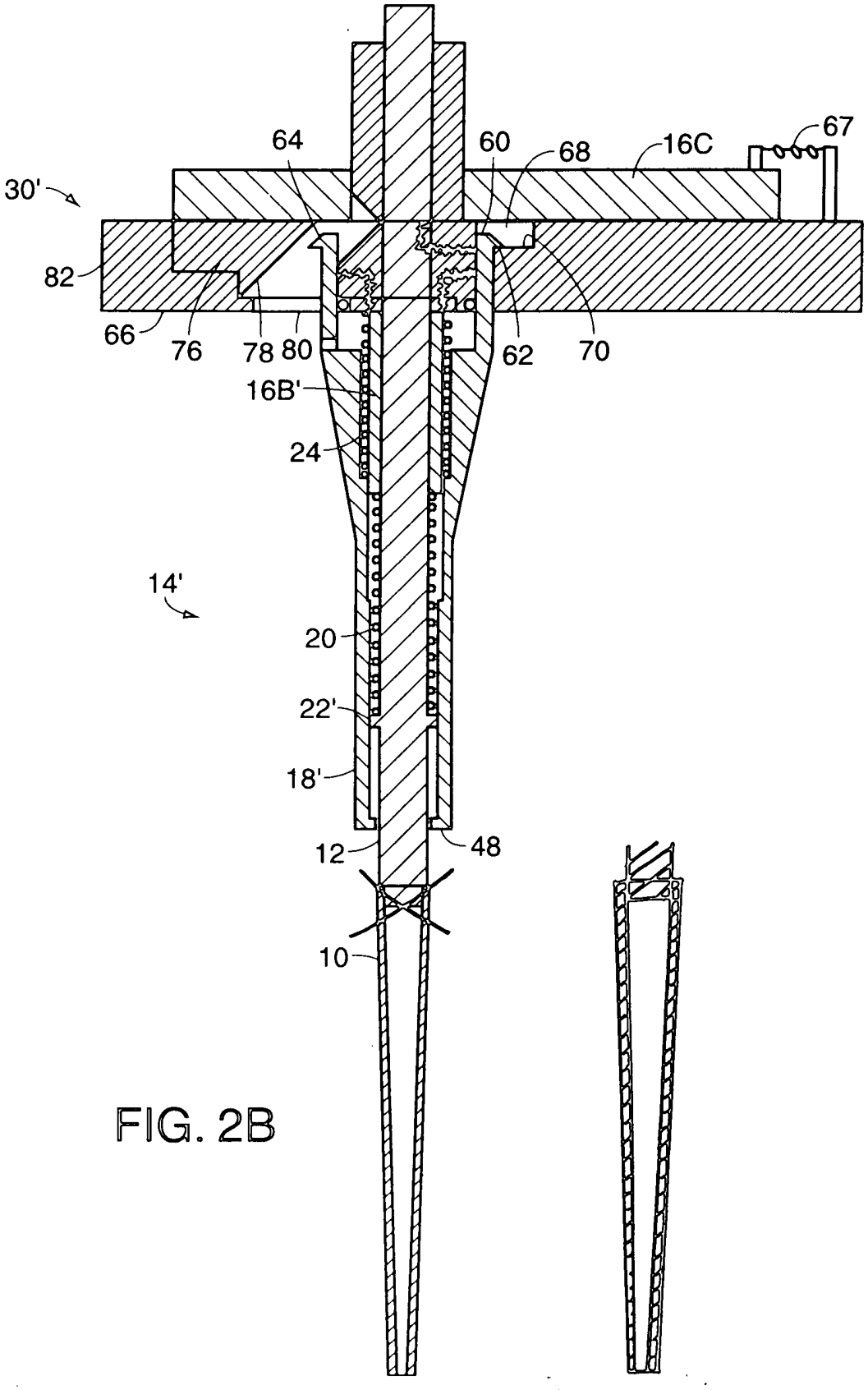


FIG. 2B

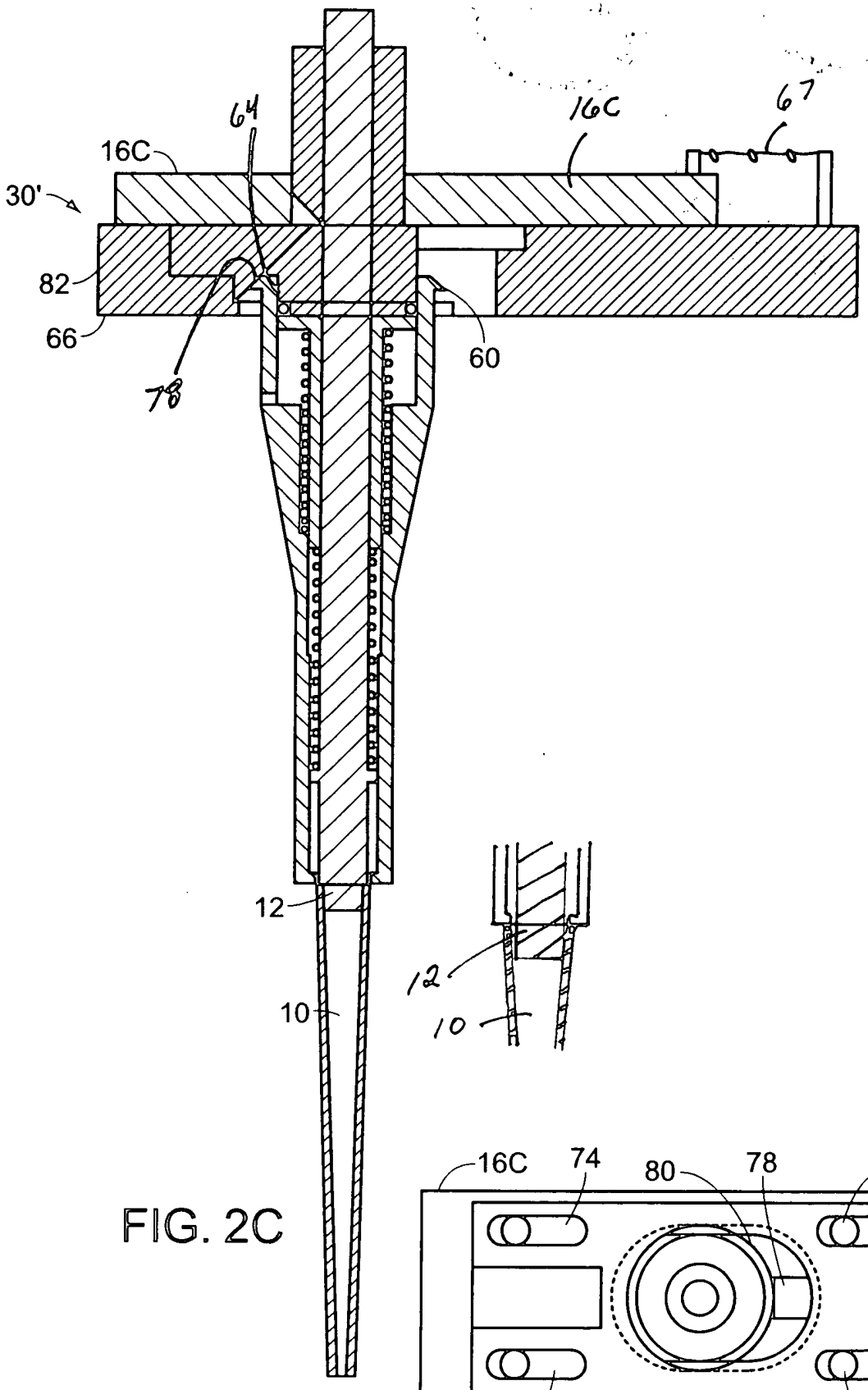


FIG. 2C

FIG. 2D

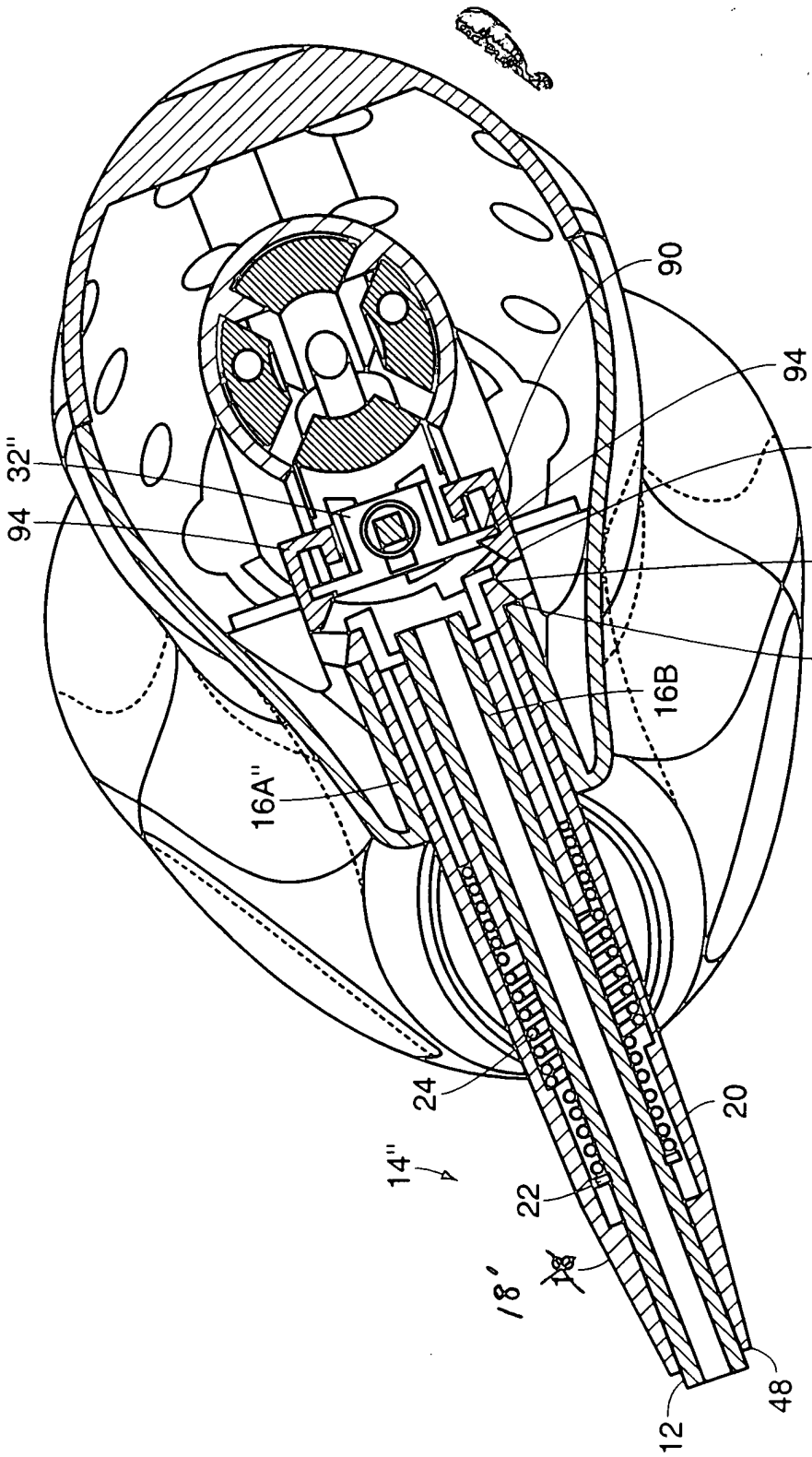


FIG. 3B